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# The Social Epidemiology of Affective and Anxiety Disorders in Later Life in Canada

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**Objective:** To examine the association between markers of social position and psychiatric disorder among older adults, and test whether social support mediates the association between social position and psychiatric disorder in this population.

**Methods:** We used data from the Canadian Community Health Survey: Mental Health and Well-Being to examine the social patterning of disorder. Using a series of logistic regression analyses, we regressed indicators of mood, anxiety, and any disorder on markers of social position and social support.

**Results:** A negative association between age and disorder was evident across all models, and the likelihood of reporting disorder was elevated among separated–divorced and widowed respondents relative to their married counterparts. Social support was statistically significant in all models, and mediated a considerable amount of the effect of marital status on disorder.

**Conclusions:** Many of the markers of social position associated with disorder among younger adults continue to be important predictors among older adults, and these variables are mediated to varying degrees by social support. The results support the general notion that social circumstances are important to psychological well-being. We discuss potential explanations for findings related to sex, age, marital status, and education as predictors of disorder in later life.

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Information on funding and support and author affiliations appears at the end of the article.

### Clinical Implications

- Being separated, divorced, or widowed is associated with increased risk of disorder in older adults. However, other markers of social position such as sex and education are not. Clinicians should be aware of the elevated risk for affective and anxiety disorders in older patients who were previously married, and also that certain well-known correlates of disorder in younger adults might be less relevant among older ones.
- Lower levels of perceived social support are associated with increased likelihood of psychiatric disorder, independent of traditional social risk markers. Among community-dwelling older adults, it is important to consider the role of interpersonal environment as a factor that might either increase or mitigate risk of disorder.
- Perceived social support appears to explain, at least in part, the association between disorder and marital status. Social isolation might be one mechanism by which risk of disorder is conferred on previously married individuals.

### Limitations

- The temporal relation between perceived social support, social risk markers, and psychiatric illness onset is unknown.
- The measures of social risk markers are based on self-report.
- A cohort effect of social risk markers and social support cannot be ruled out because of the cross-sectional nature of the data.

**Key Words:** *depression, anxiety, social factors, epidemiology*

Social epidemiology is the examination of the distribution of disease within populations by markers of social status and position.<sup>1,2</sup> As reflected by the organizational structures of both the Canadian Institutes for Health Research and the National Institutes of Health in the United States, both of which have programs dedicated to population health—social determinants of disease, it is fair to say that interest in the social epidemiology of health, both mental and physical, is alive and well within academic medicine. Proponents of social epidemiology argue that the study of social factors increases our understanding of etiological processes.<sup>3</sup> Whether they do or do not is the subject of some controversy. However, social epidemiology does provide a picture of where disease and disorder cluster in a society, and therefore allows us to gain greater insight into the differential burden of disease within populations.

Recently, there has been a call for a developmental, lifespan approach to the study of social status and health.<sup>4</sup> This approach demands attention to the role of social factors in health and illness at different points in the life course. Concerning mental health and psychiatric outcomes, the bulk of research on social factors has focused on adolescents and working-age adults.<sup>3,5,6</sup> This is perhaps not surprising, given that epidemiologic research shows a decline in the prevalence of most psychiatric disorders with age, the dementias being an obvious exception.<sup>7</sup> However, it is not clear if the social patterning (for example, SES differences) of disorder observed in younger adults persists in later life. Although prevalence rates are lower in older adults, it remains important to examine whether some social groups are at greater risk for disorder.

There are several reasons why we might expect differences in the association between social factors and mental disorder in later life. First, research outside psychiatry suggests that disparities in health by SES might increase with age, often described in terms of cumulative disadvantage,<sup>8</sup> although this

has not always been supported.<sup>9,10</sup> Although very little work has examined the relation between SES and psychological or psychiatric problems, there is some evidence to suggest that SES disparities in depressive symptoms might in fact be most pronounced in later life.<sup>11</sup> However, there is presently no comparable work on depressive disorder or anxiety. Second, some research has shown that sex differences in depression decline with age, particularly postmenopause,<sup>12,13</sup> so that sex differences in depression in older adults are nonexistent. Because sex is an important risk marker for disorder in younger age groups, it is important to establish whether it continues to be in later life. Finally, the increase in the prevalence of specific negative life transitions with age (for example, widowhood) might strengthen the association between social factors such as marital status and psychological problems in later life.<sup>14</sup> Indeed, widowhood, which is far more common in later life, is an established risk factor for depression and distress.<sup>15</sup>

Remarkably few studies have examined the association between social factors and psychological problems in later life.<sup>11,16–18</sup> Moreover, these studies focus almost exclusively on depression, particularly on depressive symptoms, rather than disorder. Contemporary studies of the association between social factors and disorders other than depression, based on DSM-IV diagnostic criteria, in later life are virtually nonexistent. In particular, anxiety disorders (for example, panic, social phobia, and agoraphobia) have been neglected in the geriatric psychiatry literature, despite being among the most common psychiatric disorders in old age.<sup>7</sup> It is important, therefore, when examining the association between social factors and disorder in later life to include a broad range of disorders based on contemporary diagnostic nosology.

In addition to examining the association between social factors and psychological problems, some researchers have attempted to explore possible mediating links connecting social position to distress and disorder in later life.<sup>16,17</sup> While a variety of factors have been proposed, one of the most important determinants of psychological well-being is social support, especially perceived social support.<sup>19</sup> This might be especially important in later life because social networks tend to shrink with age, particularly toward the end of the life course.<sup>20</sup> Indeed, one explanation for the effect of widowhood on depression is that the loss of a spouse often signals the loss of the primary source of both social and emotional support for the individual.<sup>21</sup> Social support is also a potentially important mediator in this regard because, like health, social support is differentially distributed across social positions.<sup>5,22</sup> Therefore, if the social patterning of social support and disorder are similar, then social status differences in disorder might be due to social support differences between groups.<sup>16,23</sup> We could not locate any studies in the published literature that examine

#### Abbreviations used in this article

CCHS 1.2	Canadian Community Health Survey: Mental Health and Well-Being
DSM	Diagnostic and Statistical Manual of Mental Disorders
MOS-SS	Medical Outcomes Survey Social Support Scale
OR	odds ratio
SES	socioeconomic status
WMH-CIDI	World Mental Health Composite International Diagnostic Interview

whether social support mediates the association between social factors and psychiatric disorder in later life.

To address the knowledge gaps identified above, it is necessary to have a large, population-based data source that includes not only a large sample of older adults but also multiple measures of psychiatric disorder and a reliable and valid measure of subjective social support. The recent release of the CCHS 1.2 fulfills these criteria. It includes measures of 5 common psychiatric conditions (depression, mania, social phobia, panic disorder, and agoraphobia) assessed using the WMH-CIDI, the MOS-SS,<sup>24</sup> an excellent measure of perceived social support, and a large, representative sample of adults aged 55 years or older. In this paper, we use these data to address the following research questions: Are SES, age, sex, marital status, and ethnicity (based on language spoken) significantly associated with psychiatric disorders in a sample of Canadian older adults (aged 55 years and older)? Does social support mediate the relation between social status and psychiatric disorders in this population?

## Analysis and Methods

### *The Survey*

The data come from the CCHS 1.2,<sup>25</sup> a nationally representative community mental health survey conducted by Statistics Canada (the national statistical agency) between May and December 2002. The target population included individuals aged 15 years and older living in private dwellings (98% of the population). A great deal of effort was made to interview respondents in person at their place of residence (86% of cases), and interviews could be conducted in English, French, Chinese, or Punjabi, as required or requested by the interviewee. The overall response rate was 77.0% and the total sample size was 36 984. In this survey, we focused on respondents aged 55 years and older ( $n = 12\ 792$ ).

### *Psychiatric Disorder*

In the CCHS 1.2, the presence or absence of 2 affective (major depression and bipolar disorder) and 3 anxiety disorders (social phobia, panic disorder, and agoraphobia) was ascertained with a set of diagnostic interviews based on the WMH-CIDI administered by trained lay interviewers. The WMH-CIDI is widely used in psychiatric research<sup>26</sup> and closely matches DSM-IV diagnostic criteria, with no hierarchical exclusion of diagnoses. For each disorder, one or more screening questions were used to identify respondents with core symptoms, who were then screened into the appropriate modules for any of the 5 disorders.

### *Social Support*

Social support was assessed using the MOS-SS.<sup>24</sup> This instrument is composed of 4 subscales, measuring tangible support, affection, positive social interaction, and emotional-

informational support. In this analysis, we used the full scale, calculated as the sum of the 4 subscales. Our decision to use the full scale of the MOS-SS rather than its subscales was based on 2 considerations. First, including 4 correlated measures of support, given the relatively small number of cases of disorder, would have limited our ability to accurately characterize the effect of any one subscale. Second, the 4 subscales do not appear to be distinct in the CCHS 1.2 data. An exploratory factor analysis of the MOS-SS items among respondents aged over 54 years produced a first eigenvalue of 11.5 and a second of 1.2. Based on the ratio of these values, we concluded that there was not a strong factor structure present. Reliability of the full MOS-SS in these data was good (Cronbach's  $\alpha = 0.96$ ).

### *Sociodemographic Variables*

Numerous variables assessing social position are included in these analyses. These include age, sex, marital status, education, and language spoken (defined here as the language first learned and still understood). We used a variable reflecting the highest level of education attained by the respondent as a measure of socioeconomic position. This variable was divided into 4 categories: less than high school, high school graduate (reference category), some post-secondary education, and post-secondary graduate. Education was used to measure socioeconomic position, as opposed to income or occupation, because it represents an important knowledge-based resource that exerts a powerful influence on health and health-related behaviour, and because self-reported income might not accurately reflect wealth in old age.<sup>27</sup> Our use of education as a sole measure of socioeconomic status is consistent with previous work in this area.<sup>9,10,16</sup> Language spoken was analyzed by creating 3 language categories: English only, French only, and respondents speaking neither or both official languages. While it would have been preferable to consider respondents not speaking an official language separately, this was precluded by sample size limitations. We used first language learned in preference to survey items on ethnicity per se for 2 reasons. First, particularly among older Canadians, it is difficult to construct meaningful, adequately represented categories based on ethnic identity. Second, there are likely to be meaningful cultural differences within the group of respondents identifying simply as "white" that would be lost with such an approach. Marital status categories included married or common law (reference category), single (never married), divorced or separated, and widowed. Age was available as a continuous variable and in these analyses females were compared with males.

### *Statistical Analysis*

In the first part of the analysis, we calculated the 12-month prevalence of any disorder, any affective disorder, and any



**Table 1 Sample characteristics**

Variables	<i>n</i>	%
Marital status		
Married	6780	53.0
Separated–divorced	1532	12.0
Widowed	3618	28.3
Single	851	6.7
Age		
55 to 64 years	5056	39.5
65 to 74 years	4113	31.2
75 years and over	3623	28.3
Sex		
Male	5295	41.4
Female	7497	58.6
Language		
English	8213	64.6
French	2416	19.0
Neither or both official languages	2085	16.4
Education		
Less than high school	5565	43.8
High school graduate	1860	14.6
Some post-secondary	713	5.6
Post-secondary	4564	35.9

anxiety disorder. Next, we performed a series of logistic regression analyses, regressing each of these caseness indicators on markers of social position and social support. In Models 1a, 2a, and 3a, the presence of any disorder (1a), any affective disorder (2a), and any anxiety disorder (3a) is regressed on age, education, sex, marital status, and first language understood and still spoken. In Models 1b, 2b, and 3b, social support is added. For social support to be considered a mediating variable, there must be a considerable reduction in the coefficients representing social status,<sup>27</sup> suggesting the possibility that social support mediates the association between social position and psychiatric disorder. Of course, with cross-sectional data we cannot ascertain causal associations between variables. Therefore, the change in magnitude of the coefficients for social status after introduction of the social support is a necessary, but not sufficient, condition for demonstrating a mediating effect. This technique is commonly used to assess mediating effects in the social sciences and epidemiology.<sup>29</sup>

CCHS 1.2 used a multistage, stratified cluster design to select eligible households. To correct the potential bias resulting from this complex survey design, Statistics Canada

recommends bootstrapping of all tests using a set of replicate weights that they supply. All results presented here were produced with this approach. Stata 9.0<sup>30</sup> was used in all analyses. Data for this study were obtained from the CCHS 1.2 Master File maintained at the Statistics Canada Research Data Centre in Toronto, Ontario.

## Results

The sample distribution in terms of age, sex, education level, marital status, and language first learned and still understood is presented in Table 1. Nearly 5% of respondents met criteria for at least one disorder. Three percent of respondents were identified as having a probable affective disorder and 2.4% were identified as having one or more anxiety disorder.

Table 2 presents results of the logistic regression analyses. A negative association between age and disorder was present in all models, with ORs of 0.94 to 0.95 for a single year's increase in age. These correspond to ORs between 0.52 and 0.59 for a 10-year difference. The likelihood of meeting criteria for disorder was elevated among formerly married and widowed respondents, relative to married ones, in all models not adjusted for social support, with the exception of widowhood in the model predicting any anxiety disorder. The addition of social support attenuated these effects substantially, to the point of nonsignificance in the case of widowhood in the "any disorder" model and "formerly married" in the model predicting any anxiety disorder.

First language was statistically significant in several models. Identifying French as one's first language was associated with a lower likelihood of anxiety disorders, while respondents whose first language was neither English nor French were less likely to meet criteria for anxiety disorders or for any disorder. Neither of these language categories predicted presence of a mood disorder.

Social support was also statistically significant in all models, with all ORs about equal to 0.97. This corresponds to a one-third reduction in the likelihood of disorder for an increase of one standard deviation in total social support.

## Discussion

Our findings confirm the importance of markers of social position as correlates of psychiatric disorder across the life course, in that the effects of several social factors in our sample are similar (albeit somewhat attenuated) to those reported in younger samples.<sup>16</sup> In addition to predicting psychiatric disorder directly, social support also appears to exert a mediating effect on the influence of other social factors, particularly marital status.

The principal differences in social patterning of disorder in older adults between this study and work on younger samples

**Table 2** Logistic regression of any anxiety disorder, any affective disorder, and any anxiety disorder on marital status, age, sex, education, and social support (*n* = 11 501)

Variables	Any disorder		Any affective disorder		Any anxiety disorder	
	Model 1a	Model 1b	Model 2a	Model 2b	Model 3a	Model 3b
Age	0.95 <sup>a</sup> (0.93–0.96)	0.94 <sup>a</sup> (0.93–0.96)	0.94 <sup>a</sup> (0.92–0.96)	0.94 <sup>a</sup> (0.91–0.96)	0.95 <sup>a</sup> (0.93–0.97)	0.95 <sup>a</sup> (0.93–0.97)
Education						
Less than secondary	1.09 (0.73–1.64)	1.08 (0.72–1.62)	1.09 (0.65–1.81)	1.07 (0.64–1.78)	0.85 (0.48–1.51)	0.83 (0.47–1.48)
Secondary	Reference					
Some post-secondary	1.33 (0.76–2.33)	1.29 (0.74–2.28)	1.18 (0.54–2.62)	1.15 (0.51–2.57)	1.25 (0.59–2.62)	1.21 (0.57–2.56)
Post-secondary completed	0.82 (0.54–1.23)	0.81 (0.54–1.22)	0.83 (0.48–1.41)	0.82 (0.48–1.40)	0.68 (0.39–1.21)	0.68 (0.38–1.20)
Female	1.17 (0.88–1.54)	1.23 (0.93–1.62)	0.82 (0.59–1.15)	0.88 (0.63–1.22)	1.22 (0.82–1.81)	1.28 (0.86–1.89)
Marital status						
Married	Reference					
Separated–divorced	2.45 <sup>a</sup> (1.80–3.33)	1.61 <sup>b</sup> (1.14–2.28)	3.01 <sup>a</sup> (2.06–4.41)	1.90 <sup>a</sup> (1.22–2.96)	1.94 <sup>a</sup> (1.27–2.97)	1.24 (0.76–2.01)
Single	1.49 (0.87–2.55)	0.89 (0.49–1.59)	1.61 (0.72–3.60)	0.9 (0.37–2.20)	1.14 (0.62–2.12)	0.66 (0.34–1.28)
Widowed	1.81 <sup>a</sup> (1.22–2.69)	1.37 (0.90–2.09)	2.63 <sup>a</sup> (1.66–4.17)	1.94 <sup>c</sup> (1.20–3.14)	1.31 (0.72–2.36)	0.96 (0.50–1.83)
Language						
English	Reference					
French	0.84 (0.61–1.17)	0.81 (0.58–1.12)	0.96 (0.63–1.47)	0.92 (0.59–1.42)	0.59 <sup>c</sup> (0.38–0.92)	0.56 <sup>c</sup> (0.36–0.88)
Neither or both official languages	0.63 <sup>c</sup> (0.40–0.98)	0.60 <sup>c</sup> (0.38–0.94)	0.71 (0.42–1.18)	0.68 (0.41–1.14)	0.42 <sup>c</sup> (0.18–0.95)	0.39 <sup>c</sup> (0.17–0.90)
Social support		0.97 <sup>a</sup> (0.96–0.98)		0.97 <sup>a</sup> (0.96–0.98)		0.97 <sup>a</sup> (0.96–0.98)

<sup>a</sup>*P* < 0.001; <sup>b</sup>*P* < 0.01; <sup>c</sup>*P* < 0.05

concerns the impact of sex and education. Unlike previous work,<sup>16–18</sup> we did not find a significant effect for either marker in any of our disorder classifications. In the case of education, sample size and cohort issues might be responsible: post-secondary graduation has become more common in recent years,<sup>31</sup> and its comparative rarity among older respondents, in combination with low levels of disorder, limits statistical power to test this relation. Certainly, the general pattern of results—heightened risk among people starting but not completing post-secondary education and lower risk among post-secondary graduates—is consistent with results based on

younger cohorts. The lack of an effect for less than secondary education, however, is somewhat surprising and possibly a result of education becoming more strongly associated with disorder in more recent years (and thus in younger people) because of increases in the usual or expected level of attainment. However, these results are also consistent with the healthy survivor interpretation offered by other researchers, who note a similar finding in relation to the effect of education on physical health outcomes across the life course.<sup>9,10</sup> Finally, it is also possible that differences exist in subsyndromal depression but not in full-blown disorder.<sup>16</sup>

Similar to studies on depression in younger age groups,<sup>33,34</sup> our work supports the importance of marital status as a risk marker for disorder. Separation–divorce and widowhood were independently associated with disorder, with the strongest effect observed for separated–divorced status in relation to affective disorder. In all cases, the effect of separated–divorced and widowhood was considerably reduced once social support was added to the model. This suggests that social support explains part of the effect of marital status on the likelihood of meeting the criteria for disorder. One possible interpretation is that the loss of social support that accompanies the loss of a spouse is an important source of risk for disorder.<sup>21</sup> Widowhood and separation–divorce might also be associated with heightened levels of disorder for different reasons. Widowhood is more likely to be recent, while separation and divorce more commonly occur at earlier ages<sup>35</sup>; the association between widowhood and disorder might therefore reflect the trauma of a spouse's death and the difficulty of adaptation to life alone. In this case, social support might indeed be a mediating link between this marital status and disorder—social isolation being the key mechanism. Separation or divorce, on the other hand, might be the result of, as well as a risk factor for, psychiatric disorder.<sup>36</sup> Social support may still be conceived as a mechanism linking this status to disorder, but in a much different way. In a selection model, lack of social support might be viewed as a consequence of the disorder, which leads to marital instability or dissolution. In any event, the weaker and nonsignificant effects of the variable indicating single (that is, never married) marital status supports the idea that it is marital transition rather than simply being unmarried that is associated with risk of disorder in this population. Unfortunately, detailed marital histories, including the timing of events such as divorce, were not available in these data.

In addition to acting as a mediating variable, social support is independently associated with disorder. The importance of social support for well-being in old age is well established,<sup>20</sup> and the present findings reinforce its status as a critical determinant of health and well-being<sup>10</sup> in this age group. Whether it is a cause of disorder, a consequence, or both, it is disconcerting that older adults with the greatest need for support are likely to receive less of it than those without disorder.

Finally, the negative effect of age on disorder,<sup>31</sup> the nonsignificance of sex differences,<sup>12,13,32</sup> and the lower prevalence of disorder observed in French-speaking Canadians<sup>16</sup> have been reported before in this population. Several explanations, including cohort effects, selective attrition, methodological problems, age-related hormonal changes, and other aging differences have been offered for declining prevalence of disorder with age and for the disappearance of the gender gap that is invariably found among younger adults.<sup>7,32</sup> The

precise reason for lower prevalence of disorder in old age has yet to be established, although it seems unlikely that cohort explanations alone are responsible, given the persistence of this finding over time.<sup>32</sup> Concerning the lower prevalence of disorder observed in Francophones, it is not clear whether this is the result of cultural differences or a problem with the translation of the CIDI into French (see Cairney and Krause<sup>16</sup>).

## Limitations

The findings presented here must be considered in light of the following limitations. First, given the cross-sectional nature of the data, it was not possible to test whether social status differences in psychiatric disorders converge, diverge, or remain the same with age. Similarly, it is not possible to establish the precedence of changes in social position and onset of psychiatric disorder, because data were collected at only one point in time (a recent, longitudinal data source with adequate measures of psychiatric disorder is not currently available in Canada). In addition, it is likely that the relation between social support and psychiatric disorder is bidirectional. That is, the presence of disorder might lead to an underestimation of social support, or anxiety and depression might lead to social withdrawal, which reduces both the quantity and quality of social contact. We also did not have direct measures of social adversity (for example, social stress) in these data, which might have further clarified the relation between social position, social support, and psychiatric disorder. Other markers of social position, such as wealth, were also not available. While household income is typically used as a marker for wealth among younger and middle-aged adults, it is not necessarily an accurate reflection of wealth in later life, as many older adults are no longer in the workforce. A measure of total assets might better represent this aspect of social position, but such a measure was not available.

Notwithstanding these limitations, identifying that the potential mediating pathways is a cross-sectional framework is an important first step toward an understanding of these complex relations, and this is one of only a few papers to examine the social determinants of disorder in old age. The findings presented here, especially regarding differences in the relation between social factors and mental health with age, offer important directions for future work and hold promise for providing a greater understanding of the causes and consequences of disorder across the life course. As stated at the outset, it is clear that we cannot assume that the relations between social factors and psychiatric disorder observed in younger populations are also operative in old age. At the same time, at least in the case of age, marital status, and social support, the findings presented here suggest that social factors continue to be important correlates of psychiatric disorder in later life.



Clinically, our findings suggest the importance of screening for disorder among previously married and widowed older adults, as the prevalence of depression, in particular, is higher in these groups. Moreover, while the effect of being previously married is at least partially mediated by perceived social support, the persistence of the effect of social support after adjustment for other factors suggests that the perceived quality of social interactions appears to be an independent predictor of disorder. Whether a cause or consequence of disorder, inquiry into the nature of social relationships of the older patient might be a useful method for identifying psychiatric problems in this population.

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**Résumé : L'épidémiologie sociale des troubles affectifs et anxieux du troisième âge au Canada**

**Objectif :** Examiner l'association entre les marqueurs de position sociale et de trouble psychiatrique chez les adultes âgés, et vérifier si le soutien social sert d'intermédiaire à l'association entre la position sociale et le trouble psychiatrique chez cette population.

**Méthodes :** Nous avons utilisé les données de l'Enquête sur la santé dans les collectivités canadiennes : santé mentale et bien-être pour examiner la typification sociale du trouble. À l'aide d'une série d'analyses de régression logistique, nous avons régressé des indicateurs de l'humeur, de l'anxiété et de tout trouble sur les marqueurs de position sociale et de soutien social.

**Résultats :** Une association négative entre l'âge et le trouble était évidente pour tous les modèles, et la probabilité de déclarer un trouble était élevée chez les personnes séparées-divorcées et les répondants veufs, comparé à leurs homologues mariés. Le soutien social était statistiquement significatif dans tous les modèles, et servait d'intermédiaire à une partie considérable de l'effet de l'état matrimonial sur le trouble.

**Conclusions :** Bon nombre des marqueurs de position sociale associés au trouble chez les jeunes adultes sont encore d'importants prédicteurs chez les adultes âgés, et le soutien social servait d'intermédiaire à ces variables à divers degrés. Les résultats soutiennent la notion générale selon laquelle les circonstances sociales sont importantes au bien-être psychologique. Nous discutons des explications potentielles des résultats selon le sexe, l'âge, l'état matrimonial, et l'instruction comme prédicteurs de trouble au troisième âge.